Ontario

A GUIDE TO STRENGTHEN EMERGENCY MANAGEMENT OF HIGH-RISE AND HIGH-RISK BUILDINGS

2002

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Minister's Message: A Guide to Strengthen Emergency Management of High-Rise and High-Risk Buildings

This guide has been developed as part of the provincial government's commitment to improve Ontario's emergency preparedness and to help owners and operators of large buildings improve occupant safety and security.

The provincial government has always placed public safety as a top priority. In response to the September 11th terrorist attacks, we thoroughly reviewed all measures necessary to ensure the safety and security of Ontarians. As we have demonstrated since then, the province has a sound emergency response action plan.

This guide is part of our action plan. The guide, created by the Office of the Fire Marshal in consultation with industry and government groups, applies to human-caused and natural disasters.

On behalf of our government, I wish to thank all those who helped the Office of the Fire Marshal develop this important tool. This initiative demonstrates the significant effort being made by this government to deal with the realities of potential terrorist threats.
By working together, we can continue to ensure that Ontario is the best place to live, work and raise a family.

David Turnbull
Solicitor General

A GUIDE TO

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This guideline offers assistance in identifying possible risks for high-rise and other high-risk buildings and provides suggestions, guidance and best practices that could be introduced to minimize or eliminate these risks. While these practices are recommended for these types of buildings in general, other techniques, practices or procedures may be more appropriate for buildings with specialized or specific purposes. In dealing with specialized high-rise or high-risk buildings, it may be appropriate for you to consult other sources or qualified professionals.

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Ministry of the Solicitor General
Office of the Fire Marshal

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1. Purpose and Scope

This guide is intended primarily to assist building owners, property managers and others who are responsible for emergency management in large buildings including high-rise buildings, those containing a high occupant load and other buildings potentially at risk. Both natural and human-caused risks are addressed in the guide. Types of emergencies range from people trapped in elevators to earthquakes to terrorist threats.

Preparation is the key to an effective response to any emergency. An emergency plan should not be developed under the stress associated with an emergency that is already underway. Therefore, planning, awareness training and periodic exercises introduced prior to an emergency are essential to improving building supervisory and occupant responses. Communication between building owners/managers and emergency responders is essential to ensure that the respective roles are clearly understood. This guide stresses the necessity of establishing a planning team to prepare for an emergency and a response team to make key potentially life-saving decisions in an emergency.

Numerous stakeholders participated in the development of this guide (see Appendix C). It is their hope that this information proves to be a valuable resource to reduce the risk to occupants of these buildings.

2. Background

What is an emergency?

Under the Emergency Plans Act, (note: the name of the Act may be changing; the definition of "emergency", however, should remain the same) an emergency is defined as a situation or an impending situation caused by the forces of nature, an accident, an intentional act or otherwise that constitutes a danger of major proportions to life or property.

Numerous events can be "emergencies," including:

- Fire/explosion
- Hazardous materials incident
- Flood or flash flood
- Severe weather (hurricane, tornado, winter storm)
- Earthquake
- Radiological accident
- Criminal activity
- Air plane crash

In Ontario, Emergency Measures Ontario (EMO), Ministry of the Solicitor General, is responsible for emergency management programs for the Government of Ontario.

Elected heads of council (municipalities and First Nations) are responsible for ensuring emergency management plans and programs exist within their jurisdictions. When emergencies do happen, most are dealt with routinely at the community level by local first response organizations, including police, fire and ambulances services and public works.

What services do local emergency responders provide?

Although services provided by the local emergency responders are determined by the community government that employs them, developing emergency plans for buildings is not normally a service that is provided. Therefore, it is the responsibility of the building owner/manager to determine the type of emergency plans needed for their particular building and to assign staff or hire consultants to develop their plans.

Fire safety plans that are required by Section 2.8. of the Ontario Fire Code must be approved by the Chief Fire Official. Plans for other types of emergencies do not require approval. However, building owners/managers may wish to consult

with their local fire department and other emergency responders to ensure that their plans are compatible.

What is emergency management?

Emergency management begins at home. Building owners and managers are responsible for ensuring public safety within their buildings in response to all types of risks and occurrences. This guide provides step-by-step advice on how to develop and maintain an Emergency Plan for a variety of incidents or disasters.

Emergency management is the process of preparing for, responding to and recovering from any unplanned events that could have a negative effect on your organization. Emergency management is not a one-time event, it is an on-going process. Although planning is a critical first step, it must be followed by training, drills and regular tests of building safety features and equipment. It is also important that your emergency plans be co-coordinated with those of the community.

Successful emergency management must have the support of upper management. The owner, chief executive officer, building manager or plant manager establishes the importance of the process by instructing management to perform the necessary planning and associated activities to create an effective emergency plan.

It is easier obtaining support for emergency management activities if the benefits of being prepared are stressed rather than the consequences of an emergency (e.g. deaths, injuries, financial loss). For example, effective emergency management:

- Can reduce damage to the building and/or equipment thus allowing the company to recover faster.
- Assists in compliance with health and safety related regulatory requirements.
- Helps to show the organization showed "due diligence" and may reduce exposure to civil or criminal liability in the event of an incident.
- Helps convey the image that the organization is a concerned "citizen" of the community.

What are the key steps in establishing an Emergency Plan?

There are 5 main steps in establishing an Emergency Plan. They are as follows:

Step 1 -- Establish an Emergency Management Team

Step 2 -- Analyze Risks and Response Capabilities

Step 3 -- Develop the Plan

Step 4 -- Provide Training and Exercise the Plan

Step 5 -- Test, Evaluate and Modify the Plan

Details on each of these steps can be found in Section 5 of this guide.

Regardless of plans developed for specific occupancies, building owners/managers and occupants must clearly understand that their safety depends on knowing and understanding their roles within the plans and appropriate actions to be taken during an emergency or drill.

3. Building Vulnerability Assessment

Although emergencies could happen anywhere and at anytime, certain types of emergencies are more likely to occur at some properties than at others. There are five factors that affect the vulnerability of a building to certain types of emergencies. These factors are:

- Geographic Location
- Immediate Environment
- Property Type
- Tenant Mix Or Resident Profile
- Size And Construction

In developing an Emergency Plan these factors should be assessed to ensure that those risks that are specific to your building are adequately addressed.

Geographic Location

Certain geographic portions of the country are more prone to certain types of emergencies, particularly those relating to natural disasters. Fortunately for Ontarians, earthquakes and hurricanes occur less frequently here than in other geographic locations. However, severe winter storms and tornadoes that may result in heavy flooding do occur on a regular basis. As such, the property manager must evaluate the likelihood of these types of events occurring where his/her building is located and plan accordingly for those types of emergencies.

Immediate Environment

The neighbourhood or community where your property is situated will influence the type of emergencies it may face. Buildings located in major urban areas face unique risks that are less likely to be found in rural areas. For example, riots and public demonstrations are more likely to occur in urban areas and may result in property damage and personal assaults.

Similarly, buildings located in close proximity to major transportation routes or industrial properties, such as nuclear power plants or hazardous petroleum/chemical plants, would be vulnerable if a major accident were to occur there. Therefore, the Emergency Plan should address potential emergencies that may occur as a result of an accidental leak or spill.

An important part of a property manager's responsibility in developing an Emergency Plan is to be aware of the different types of potential threats that may exist. A good place to start in assessing threats is to obtain a copy of the community emergency plan. Many communities have these plans or are in the process of developing them. External resources may be particularly helpful in identifying threats from sources outside of the building. Owners/managers may

need to speak to police and fire officials as well as neighbouring building owners/managers to gain an appreciation of their exposure to these risks.

Property Type

The purpose for which the building is used, has a direct bearing on the type of risks inherent to it. Residential towers, office towers, industrial plants, hospitals, theatres, and shopping malls all require their own unique Emergency Plans to address their particular situations and needs. All offer different challenges based on varying factors specific to their occupancy. The number of hours per day it is occupied, occupant load, building height security levels, building contents, presence of hazardous products, and nature of activities are all examples of varying factors that must be taken into consideration when developing the Emergency Plan.

Tenant Mix or Resident Profile

Buildings that are occupied by politically sensitive organizations such as government offices, military establishments, religious organizations, embassies, cultural centres or abortion clinics have an increased likelihood of being the targets of extremist groups. As such, the Emergency Plan may need to specifically address threats, hostage situations or other criminal related emergencies.

It is important to realize that not all residential buildings are alike, nor are all commercial, industrial and institutional properties alike. For example, residential buildings may contain apartments that are occupied by typical families or by people with special needs such as senior citizens or those with disabilities. Is your industrial building used to store automobile parts or is it a flammable liquids processing facility? Does your commercial plaza also house industrial tenants or simply business and mercantile establishments? Your Emergency Plan should take into account the various tenant profiles within the property to address their specific needs and risks.

Size and Construction

The size of the building with respect to height and area often determines the complexity of the Emergency Plan. Obviously, a 70 storey office tower will require a more complex Emergency Plan than a single storey commercial plaza.

Whether the building is sprinklered or not will influence the Emergency Plan, for example, by making it more or less viable to remain in the building in the event of a fire. The building's construction may also be critical in determining how well it will withstand a natural or human activity related disaster.

Vulnerability Checklist

The following examples of occupancies may be particularly vulnerable. If your building or an adjacent building contains one or more of these occupancies, and depending on the level of in-house expertise, you may wish to retain the services of a consultant specializing in vulnerability analysis and risk assessment to conduct a detailed evaluation of your building.

- ☐ Military establishment,
- ☐ Foreign embassy, consulate or high commission,
- ☐ Sensitive religious building
- ☐ Nuclear agency office or facility
- ☐ Petro/chemical office or refinery
- ☐ Military contractor
- ☐ Police facility
- ☐ Storage or manufacturing facility for explosive, flammable, or toxic materials
- ☐ Public parking located underneath or beside the building
- ☐ Financial institution or bank
- ☐ Pharmaceutical firm
- ☐ Hospital or medical clinic
- ☐ Radical political groups
- ☐ Symbolic or historical building
- ☐ News media
- ☐ Chemical/biological laboratory
- ☐ Toxic waste facility
- ☐ Power generation or distribution centre
- ☐ Waterworks
- ☐ Jail
- ☐ Government (federal, provincial, or municipal)
- ☐ Transportation (airport, bus terminal, rail station)

For additional information see:

Emergency Management Guide for Business and Industry, Federal Emergency Management Agency

http://www.fema.gov/library/bizindst.pdf

4. Security Measures

How important is security in deterring illegal acts?

Preventing unauthorized entry of persons is one step in reducing the risk of illegal acts. Features can include fencing, locked doors, electro-magnetic locking devices, video surveillance equipment, check points and trained on-site security personnel to name a few.

The security measures introduced must be balanced with safety. Security measures must never interfere with building features designed to facilitate escape. Similarly, once a building has been evacuated, security procedures must be in place to control the re-entry of building occupants, so that security can be maintained.

The degree of security provided is primarily based upon the nature of the building occupancy, its design and associated needs and risks. Professionals familiar with security measures should be consulted.

The following information identifies a variety of security components that can be improved, utilized or adopted.

Access control: Access control measures can range from simply having locked areas that are required to be secured to having security at entry points, and utilizing one or more of the many types of card-readers, chip-readers, and electronic locks that read information encoded on the cards, disks, or keys carried by employees. Common systems incorporate insertion- or swipe-readers that interpret magnetic-stripe cards, or proximity-readers that do not require physical contact with the cards they read. Other components may include the software for managing the distribution and encoding of cards and the processing of transactions, as well as the strikes, contacts, and releases that operate doors. Some more sophisticated systems incorporate biometric devices based on fingerprints, voiceprints, retinal patterns and the like, to allow or forbid access to restricted areas.

Intrusion detection: A variety of alarms are available. Although infrared motion sensors are mostly used to protect interior spaces, there are also motion detectors available for exterior use. Other devices detect the shattering of glass, or the opening of windows and doors. Video motion detectors that detect movement on video signals transmitted from closed-circuit TV (CCTV) cameras are also available.

Lighting: One of the most basic and cheapest security components. Carefully designed and coordinated interior and exterior lighting systems can have a significant deterrent effect.

Monitoring and surveillance: Includes simple and sophisticated CCTV cameras and the monitors and security command centres they serve.

Vehicular traffic and parking control: These components can also often play a role in building security. Not allowing the public access to underground parking garages and (spacing) keeping vehicles a safe distance away from the building reduces the potential for terrorists to use a car bomb to attack the building.

Perimeter control: Includes elements such as fences, walls, and landscaped berms that protect a facility's potential access ways.

Managers must ensure that the building occupants understand the purpose of the various security features and how they will benefit from the increased security. They will then be more likely to follow proper security procedures.

For additional information see:

RCMP *Guide to Physical Security*

http://www.rcmp-grc.gc.ca/tsb/pubs/guides/sag_ch3_phys.pdf

Cooper, Walter and DeGrazio, Robert, *Building Security: An Architect's Guide*

http://jya.com/archsec.htm

RCMP *Guide to Information Technology Security – Threat and Risk Assessments*

http://www.rcmp-grc.gc.ca/tsb/pubs/guides/sag_ch4_itsecurity.pdf

Canadian Alarm and Security Association

http://www.canasa.org/

5. Developing the Emergency Plan

How do I plan for an emergency?

Every plan must be tailored to the specific building and circumstances. An Emergency Plan is best developed by gaining the input of the various affected parties, analyzing risks and response capabilities, drafting and reviewing the plan, and implementing and refining the plan based on feedback.

Step 1 – Establish an Emergency Management Team

The property manager or an appointed designate should take the responsibility for organizing an Emergency Management Team and developing the emergency management plan in cooperation with tenant representatives. Emergency planning is the responsibility of the building owner/manager and not the emergency services.

In multi-tenant buildings, the Emergency Management Team should include a representative from each tenant occupancy. The senior manager of the tenant occupancy should appoint this person.

Circumstances may require specialized input from facility and process managers, building designers and other qualified individuals. In single tenant buildings, it would be beneficial to obtain input from:

- senior management
- operations management
- staff
- engineering, maintenance and custodial staff.

In multi-tenanted buildings many more parties will have to be involved.

The Emergency Management Team's purpose must be defined. The purpose could include the development and exercise of:

- emergency plans for dealing with various types of natural and human-caused emergencies including terrorist threats or incidents,
- internal communications procedures for use during an incident or threat,
- training for building occupants and key personnel in the Emergency Plans.

Step 2 – Analyze Risks and Response Capabilities

This step entails gathering and analyzing information. Where available, the community's Emergency Plan may be a valuable resource. The risks and hazards must be identified as well as the response capabilities that are available. Once the information has been gathered, a vulnerability analysis (See Section 3

for more information) is conducted to identify gaps in the facility's capabilities for handling the emergencies. Review existing emergency plans. In many instances these existing plans and procedures contain valuable practices and strategies for responding to, and dealing with various risks and threats. These could include, where applicable, the following existing plans or procedures:

- fire safety plan (including current building/site plans that clearly label all tenant spaces)
- health and safety program
- environmental policies
- security procedures
- shut-down procedures
- hazardous materials containment plans
- risk management plans.

Identify applicable federal, provincial and community regulations and by-laws such as:

- occupational health and safety regulations
- Ontario Fire Code
- environmental regulations
- zoning regulations
- Community Emergency Plan

Identify internal and external resources and capabilities that could be utilized in an emergency:

- personnel – security, emergency management group, fire wardens or floor wardens, hazardous materials response team (where applicable), first-aid providers – identify times of day or circumstances when key building personnel are not available to undertake their assigned duties

- equipment – communications, warning systems, security, emergency power equipment, containment equipment, first aid supplies, fire protection, fire suppression

- building emergency features that can be operated from remote locations during an emergency, such as HVAC, smoke control, communication, warning and security systems

- facilities – evacuation facilities, temporary shelter areas, first-aid stations, decontamination facilities

- organizational capabilities – training, evacuation plan, employee or occupant support system

- internal backup systems – communications, emergency power, recovery and support

The equipment and systems available in a building to deal with an emergency will vary considerably depending on the size and age of the building, the type of occupancy and what is legally required. After determining what is currently available, managers must also determine if additional equipment or systems should be provided even if they are not legally required.

Identify external resources that would be required during an emergency including emergency protocols for contacts. These could include:

- police
- fire department
- emergency medical services
- community emergency management co-ordinator
- community social service agencies
- hazardous materials response organization
- transportation services
- utilities
- Professional Engineers and Architects
- contractors
- suppliers of emergency equipment

NOTE: The activation and deployment of external resources does not relieve building owners/managers and occupants of their responsibility to provide for their own safety in accordance with established plans during an emergency in a building.

Step 3 – Develop the Plan

The Emergency Management Team should develop the Emergency Plan using the most up-to-date information. Drawings, tenant information, contacts, etc. need to be current and accurate to be useful. Elements of the plan should include:

- Emergency Management – outlines the following key components:
    - a protocol for who will be in charge
    - notification and communications procedures
    - life safety elements
    - property protection
- Incident Emergency Response – identifies the procedures outlining how the facility and occupants will respond. This part of the plan should also address procedures for dealing with emergencies during peak usage periods and after hours.
    - The plan must include provision for dealing with disabled people, both regular occupants and visitors.
    - The plan must stress that evacuating to the roof is not an option during a fire, despite what might be seen in the media. Suitable helicopters for this purpose are not readily available in Ontario. Even if they were available, such a procedure is very dangerous for both the building occupants and the helicopter crew. The thermal currents created by the fire make the helicopter very difficult to control. The downdraft from the helicopter rotor can force smoke and hot gases on top of building occupants or fire personnel.

Before finalizing the plan, it is important for building management to consult with the local emergency response agencies (police, fire department, community emergency co-ordinator, etc.) to ensure that the Emergency Plan is well coordinated between all parties and coincides with local practices. Protocols and details that need to be worked out and incorporated in the plan could include:

- Their emergency notification requirements.
- The conditions where mutual assistance will be necessary. (e.g. many nursing homes or hospitals have arrangement with other facilities for temporary housing of occupants in the event of an emergency.) In most cases, this will be identified by outside resources.
- Identify primary and alternate entrances for responding units.
- Where and whom will they meet?
- How will facility personnel communicate with outside responders?
- Who will be in charge during the emergency?
- How will the plan be communicated to building occupants?

Communications

At some point during or after an emergency or disaster it will be necessary to communicate with various groups. These could include:

- emergency response organizations
- employees
- neighbours
- media
- government regulatory agencies
- unions
- elected officials

A spokesperson, and an alternate, should be appointed to deal with the media. This person should be a senior official in the organization and should have training in dealing with the media.

Following are some guidelines for dealing with the media.

- Do not allow anyone other than the designated spokesperson to release information.
- Do not play favourites. Give all media access to the same information.
- Try to have consideration for their deadlines.
- Be factual. Don't speculate.
- Do not cover-up or try to mislead the media.
- Keep records of all information provided to the media. Provide written press releases when possible.
- If the media will be on the site if the emergency/disaster, ensure that appropriate safety precautions are followed.

Step 4 – Exercise the Plan

Exercising the plan will involve training, practice exercises and evaluation.

In single tenant facilities, the plan should become part of the corporate policies and be managed effectively.

In multi-tenant facilities, the plan must be adopted by each tenant and be integrated into the workplace procedures for occupants to follow during an

emergency incident. Key personnel in each tenant space may require special training or instruction to ensure they can conduct the assigned duties. Practice drills can be conducted to determine if the procedures and the desired communications are effective.

How is the Emergency Plan shared with the building occupants?

Once the Emergency Plan has been developed, occupant and tenant information needs to be provided to them so that they can become aware of the emergency procedures.

Initially, occupants can be provided with printed instructions in a variety of formats including: brochures, newsletters, workplace policies, workplace procedures, etc. Many of these printed materials can be distributed to each individual and in other instances, the Emergency Plan should be prominently placed in common areas including lunch rooms and lounges, accessible to building occupants for their review.

Other methods can be used to inform and train the building occupants. These may include:

- offering periodic information and awareness presentations,
- providing direct training and instruction to individuals who are assigned special tasks,
- producing and distributing demonstration or instructional videos.

To help people to become familiar with their surroundings, building signage should be used to identify areas of refuge, location of emergency equipment, exits and evacuation instructions.

Training, Drill and Exercise Considerations

In addition to the training, individuals have key roles to play during an emergency. Everyone working in the facility will require some form of training to become familiar with the established Emergency Plans. This could include distribution of the specific procedures to each employee and occupant/tenant, periodic discussion sessions with occupants and tenants to review the procedures, technical training in the use of special equipment if necessary and participation in evacuation drills intended to improve awareness of the egress features provided in the building.

Step 5 – Test, Evaluate and Modify the Plan

The Emergency Management Plan and procedures should be audited at least annually and, when necessary, modified and the Emergency Plan should be reviewed:

- after each training drill or exercise;
- after each emergency;
- when personnel or their responsibilities change;
- when tenants change;
- when layout or design changes of the facility impact on the plan or procedures; and
- when policies or procedures change.

Conducting Drills And Exercises

In addition to conducting fire drills at the frequency required by the Fire Code, it is also necessary to periodically assess the other types emergency procedures similarly through exercises or drills.

The purpose of conducting drills and exercises is to:

- assess the ongoing effectiveness of the facility's emergency procedures given different scenarios and make corrections where necessary;
- determine that sufficient adequately trained people are available to respond and carry out the activities outlined in the emergency procedures;
- ensure that the building occupants understand how to react in accordance with the building's emergency response and evacuation procedures; and
- provide an opportunity for emergency response training and practice.

Consider the following to determine if the objectives for the exercise or drill are achieved:

- Does the tenant management support the plan and participate appropriately in the exercise/drill scenarios?
- Are problem areas and resource shortfalls identified and addressed adequately?
- Does the plan reflect lessons learned from previous drills and actual events?
- Do individuals with specific duties specified by the procedure understand their responsibilities? Are they willing to perform their assigned activities? Can they perform their assigned activities? Are new personnel with specific responsibilities adequately trained?
- Have the risks and hazards changed in the facility or in land use around the facility?

- Have the key contacts changed? (names, titles, telephone numbers)
- Do building occupants know where their primary and secondary exits are situated in the event their normal escape route is contaminated or blocked?
- Is the existing method of communication adequate for relaying information and instructions to key personnel and building occupants during an emergency? If not, should other methods of communication be pre-planned? (For example, by private telephones, cell phones, pagers, or some other means.)

Drills and exercises can be conducted in a number of ways. The exercise can be used to provide additional training for designated individuals by allowing them to become more familiar with the use of the building's safety features and communications protocol. For example, designated individuals responsible for communications should practise using the communication equipment and other equipment where applicable based upon the scenario to gain experience and confidence.

It is very important that all personnel with specific responsibilities attend a debriefing meeting following every drill. This meeting is held to review the procedures and reactions of all participants. During the debriefing, problem areas can be identified and, if necessary, solutions to overcome any deficiencies in implementing the facility's Emergency Plan can be discussed and corrected.

In addition to conducting full-scale drills or exercises, smaller independent exercises can be conducted at different times involving designated departments or specified areas of the building on different shifts. During these independent exercises, tenant managers, department heads, supervisors or other designated persons monitor the emergency response of employees in a specific area to a simulated or described emergency scenario. Employees in an area would respond to a simulation in accordance with their emergency procedures. These smaller independent drills and exercises provide an opportunity for assessing the adequacy of employee emergency preparedness on all shifts, in individual tenancies, departments or area-specific emergency procedures.

Each drill or exercise must be evaluated and documented with recommendations for improvements by designated individuals who thoroughly understand the facility's emergency procedures and expected response by designated individuals and occupants.

The frequency and nature of the drills and exercises should be determined based upon the potential risks, probable scenarios and the needs for training and emergency preparedness assessment.

Finally, the Emergency Plan must be readily accessible by emergency responders.

The creation of an emergency plan is not a one-time event. It must be regularly reviewed and up-dated to ensure that it reflects any changes to the facility or operations. Building owners/managers need to make a special effort to ensure that information is kept up-to-date. One of the major shortfalls in most plans is that the drawings, tenant information, contacts, etc. are allowed to become inaccurate as a result of changes that invariably occur.

For additional information see:

Emergency Measures Ontario

http://www.solicitorgeneral.msg.gov.on.ca/english/public/emo.html

Emergency Management Guide for Business and Industry, Federal Emergency Management Agency

http://www.fema.gov/library/bizindst.pdf

National Research Council - *Review of Evacuation Strategies for Occupants with Disabilities*
http://www.nrc.ca/irc/fulltext/ir712/ir712.pdf

6. Emergencies Due to Human Activity

Emergencies arising from human activity can include situations instigated by an intentional criminal, human error or situations resulting from large-scale industrial accidents.

Criminal acts such as bomb threats have historically been one of the most common types of threats. However, recent public concern has also focused on threats associated with biological and chemical agents.

Accidents that occur in industrial facilities may place neighbouring property and lives at risk. Of particular concern are accidents that involve facilities that store large quantities of toxic chemicals.

This section covers the procedures that should be developed to address a major emergency due to human activity. It provides the necessary steps that should be taken by those who are directly responsible for building emergency preparedness as well as information that may be useful to building occupants. The building occupants' roles and responsibilities should always be included in the Emergency Plan and should be available to them as a reference. Regardless of whether or not they have been delegated any formal responsibilities, occupants play an integral part in effectively executing the Emergency Plan and ensuring their own personal safety. Their role is particularly important in buildings where delegated emergency personnel are not available 24 hours a day, 7 days a week.

Many types of circumstances besides fire may require a building or portions of a building to be evacuated. Some of these circumstances are discussed in the following subsections of the guideline.

Other types of circumstances warranting evacuation that are not discussed in detail could include: serious fires in a neighbouring building, a serious hazardous chemical spill involving the transportation of a dangerous product(s), forest fires, a large natural gas leak originating outside of the building, etc.

Usually in these types of situations, local authorities will likely be involved in responding to, and/or monitoring the emergency situation. Where applicable, building management should consult with authorities to determine an appropriate course of action. However, in some situations, a decision to evacuate may have to be made by building management on their own without the opportunity for consultation.

When circumstances warrant an evacuation, the building occupants must be notified in an appropriate manner, taking into consideration the serious nature and urgency of the situation.

For additional information see:

Strategies in Building Evacuation, NFPA

http://www.nfpa.org/BuildingCode/Building_Evacuation/building_evacuation.asp

6.1 Fire / Explosion

Fire is one of the most common risks to buildings, property and life safety. In order to minimize the risk and impact of fire, Section 2.8 of the Ontario Fire Code outlines requirements for owners and managers of certain types of buildings and occupancies to develop and implement a Fire Safety Plan. Many buildings will already have a Fire Safety Plan approved by the local Chief Fire Official.

Buildings are designed and constructed to confine and control a fire to allow building occupants time to evacuate. Buildings are also designed to allow fire department personnel time to access and gain control over the fire. Buildings are designed for the expected fire loads they will encounter during their lifespan. Bombs, terrorist acts or some arsons may exceed these expectations and subject the building to fire loads for which they were not designed. For example, a building designed to maintain its structural stability for three hours, may fail in a much shorter period of time under these adverse conditions.

Equipment and procedures dealing with egress and exit facilities, fire alarm systems, voice communication systems, fire suppression systems and other life safety devices and features will play a major role in enhancing occupant safety in the event of a fire and/or explosion. Property owners and managers must ensure that these life safety features are maintained in operable condition and ready for use at all times.

An approved Fire Safety Plan typically contains:

a) the emergency procedures to be used in case of fire including sounding the fire alarm, notifying the fire department, provisions for access for fire fighting, instructing occupants on procedures to be followed when the fire alarm sounds, evacuating endangered occupants and confining, controlling and extinguishing the fire,

b) the appointment and organization of designated supervisory staff to carry out fire safety duties,

c) the instruction of supervisory staff and other occupants so that they are aware of their responsibilities for fire safety,

d) the holding of fire drills including the emergency procedures appropriate to the building,

e) the control of fire hazards in the building,

f) the maintenance of building facilities provided for the safety of occupants,

g) the provision of alternative measures for the safety of occupants during any shutdown of fire protection equipment and systems or part thereof, and

h) instructions, including schematic diagrams, describing the type, location and operation of building fire emergency systems.

Even when the building or property is not required by the Fire Code to have a Fire Safety Plan , property management should, at a minimum, develop and introduce emergency fire procedures for occupants and key property personnel to follow in the event of fire.

For additional information see:

Fire Safety Planning for Industrial Occupancies

http://www.gov.on.ca/OFM/guidetec/2000-02ind.htm

Guidelines for Stairwell Signs in Multi-Storey Buildings

http://www.gov.on.ca/OFM/guidetec/stairs.htm

Fire Safety Planning for Recycling Facilities and Waste Processing Operations

http://www.gov.on.ca/OFM/guidetec/98-06recy.htm

Tenant *Information – Fire In Your Apartment Building*

http://www.gov.on.ca/OFM/pubsafet/fiyab.htm

Tenant Information – *Fire in Your Apartment Building – Stay or Go?*

http://www.gov.on.ca/ofm/96commun/96-035at.htm

Tenant Information – *Plan Ahead – Fire Safety In Apartment Buildings*

http://www.gov.on.ca/OFM/pubsafet/plan.htm

6.2 Bomb Threats

Bomb threats are usually made by telephone. Few of these threats are real. Bombers that go to the trouble of manufacturing and placing a device typically will not call in a warning.

Bombers usually prefer to place devices in easily accessible locations (e.g., outside of buildings, lobbies, near exits) to minimize risk of capture. Evacuating a building without first checking these common areas may put occupants at increased risk. Bombers have used telephone threats to herd people towards a device.

Good housekeeping simplifies the task of identifying suspicious packages. Security measures make it more difficult to plant a bomb. Locking cabinets, rooms, offices, etc. also limits unauthorized access and reduces the areas that need to be searched.

Building owners and managers should consider the following in establishing procedures for this type of threat:

Who should make the decision regarding whether or not to evacuate?

If sufficient warning has been provided, the building owner, building manager or other senior designated individual should make the decision whether or not to evacuate. It is important that the primary manager and alternates responsible for this decision are recognized by the occupants as having the authority to make these important decisions. Their decision may be made with advice from the police, fire department or other knowledgeable persons. Public safety should always be the foremost consideration.

Should an evacuation occur for every bomb threat?

Although very few bomb threats are real, it cannot be overlooked that bombs have been located in connection with threats. If occupants learn that bomb threats have been received and ignored, it could result in morale problems and have long-term adverse effects. Also, there is the possibility that if the bomb threat caller feels that they are ignored, they may go beyond the threat and actually plant a bomb.

Evacuating immediately on every bomb threat is an alternative that on face value appears to be the preferred approach. However, the negative factors inherent in this approach must be considered. The obvious result of immediate evacuation is the disruptive effect. For example, if the bomb threat caller knows that your policy is to evacuate each time a call is made, they can continually call and disrupt your business. An employee, knowing that the policy is to evacuate immediately, may make a threat in order to get out of work. A student may use a bomb threat to avoid a class or miss a test. A bomber wishing to cause personal injuries could place a bomb near an exit normally used to evacuate and then call in the threat.

What evacuation procedures should be implemented?

- There are three options available depending on the situation:
    - Complete evacuation of the premises
    - Partial evacuation to a safe outside area or another internal area
    - No evacuation
- Where it is decided that an evacuation is necessary, ensure that the evacuation team is in place and ready to assist occupants to safely evacuate the building.
- Where it is decided that an evacuation is necessary, it should not be initiated until supervisory staff has determined that the evacuation route has been searched and confirmed to be safe.

- Where it is decided that an evacuation to the outside is necessary, people should move at least 100 m away from the building (flying glass is usually one of the key dangers in a bomb blast).

- Where it is decided that evacuation to another internal area is necessary, personnel should be relocated to another section or floor of the facility.

- Where it is decided to "shelter in place" (see Section 6.3), this information and the rationale for this decision should be communicated to the occupants.

What should occupants do if they receive a bomb threat by telephone?

Occupants should follow the bomb threat procedures set out in Appendix A.

What procedures may be established for conducting a bomb search?

Initiating a search after a threat is received and evacuating a building after a suspicious package or device is found is perhaps the most desired approach. It is not as disruptive as an immediate evacuation and will satisfy the requirement to do something when a threat is received. If a device is found, the evacuation can be accomplished expeditiously while at the same time avoiding the potential danger areas of the bomb.

If the decision is made to search the premises, the search must be as speedy and as thorough as possible. The manner in which the search is conducted is very important. It should always be systematic; unorganized searches may leave areas unchecked. Effective and efficient search techniques should be developed and made known to all relevant personnel.

Note: Even if the decision is made to evacuate immediately, the evacuation routes must be searched before evacuation takes place.

Who should carry out the search?

Authorities are in agreement that the most effective and fastest search of a building can be made by the normal occupants of that building. The occupants are in the best position to conduct the search because they are the only ones who will know if a box, briefcase, etc. belongs in that location.

However, under Ontario health and safety legislation, workers cannot be forced to take part in any activity which could be hazardous to their health or safety. Therefore, any employees who engage in bomb searching activities must be volunteers. They should be provided with appropriate training in searching for bombs.

If the facility has a public address system, it can be used to alert occupants and teams designated to search common areas (e.g., exit pathways, lobby).

Where should occupants search?

Each occupant should quickly search his or her own immediate work area.

Designated persons should search the evacuation routes and assembly areas, building entrances and exits, public areas within buildings or other areas that are easily accessible by intruders. Past experience has shown that bombs are usually placed outside buildings or in public areas within buildings. These areas must be checked with special care.

It should be noted that searches can be conducted more efficiently if work areas are kept orderly and as much storage as possible is kept in locked rooms or cabinets.

How should occupants search?

It is vital that a plan is prepared that enables the premises to be searched as quickly and as effectively as possible.

The aim of the search is to identify any object which:

(a) should not be there;

(b) cannot be accounted for;

(c) is out of place; or

(d) becomes suspect for any other reason (e.g. suspiciously labelled, similar to that described in the threat).

Explosives can be packaged in a variety of containers. Most likely it will be camouflaged. The container is likely to be a common article such as a shoe or cigar box, a grocery bag, an athletic bag, airline flight bag, suitcase, attaché case, etc. Look for the unusual or something that appears to be out of place. Anything that does not belong, or whose nature and presence cannot be adequately explained is a suspicious object.

Without planning, control and communication, only a cursory search can be conducted. A control centre must be established where the designated facility authorities are able to communicate with individual searchers or search teams. Searched areas can then be recorded as cleared and the control authority will be cognizant of progress, problems and the location of searchers.

General priorities for searches can be established and usually follow a sequence:

- outside areas,
- building entrances,
- public areas within buildings, e.g. hallways, washrooms and reception areas,

- stairways and elevators,
- interior rooms, and
- janitor's closets, telephone rooms etc, if not secure.

The areas listed above are the areas which are most accessible to the "bomber" and which persons must pass by or through during an evacuation. The initial search of these areas will ensure greater safety during the movement of personnel. Once a systematic search of public areas has been conducted, the Search may expand to the remaining areas not generally accessible to the public.

CAUTION: Searching should not be conducted within one half-hour before to one half-hour after a detonation time provided in a specific threat.

Should a suspect device be discovered:

- **DO NOT TOUCH IT.**
- **DO NOT ASSUME IT IS THE ONLY ONE.**
- **NOTIFY THE CONTROL CENTRE IMMEDIATELY FOR THE IMPLEMENTATION OF APPROPRIATE PROCEDURES.**

A rapid two-way communication system is of utmost importance. Normally communication between wardens, search teams and the control center can be accomplished through the existing telephone system, or the building's internal communication system.

CAUTION: Use of radios or cell phones could be dangerous. Their signal could cause premature detonation of an electric initiator (e.g., blasting cap) or premature activation of a remote detonating device.

For additional information see:

RCMP – Technical Operations Directorate, Canadian Bomb Data Centre

http://www.cbdc-ccdb.org/english/cbdc_eng.htm

Toronto Police Services – Emergency Task Force - *Bomb Threat Procedures*

http://www.torontopolice.on.ca/etf/etfbtrpr.html

U.S. Department of the Treasury - Bureau of Alcohol, Tobacco and Fire Arms – *Bomb Threats and Physical Security Planning*

http://www.atf.treas.gov/explarson/information/bombthreat/index.htm

Blast-Resistant Precautions

The design and construction of high-risk buildings to provide life safety in the face of explosions is receiving renewed attention. Steps for reducing the impact of an explosion can include introducing enhancements in structural design coupled with a buffer zone surrounding the building.

For additional information see:

"Designing Terrorist-Resistant Buildings", in Fire Engineering, Tod Rittenhouse, November 1995

http://www.wai.com/AppliedScience/Blast/blast-fireeng.html .

Blast Resistant Design Of Commercial Buildings in Practice Periodical on Structural *Design* and *Construction*, Vol. 1, No. 1., Mohammed Ettouney, Robert Smilowitz and Tod Rittenhouse, February 1996.

http://www.wai.com/AppliedScience/Blast/blast-struct-design.html

What Is Practical Bomb Defense For American Businesses? Security Technology & Design, Ronald J. Massa, Nov. 1999

http://www.rjagroup.com/rja/ecorner/rmassa.html

Protecting Buildings From Bomb Damage, Transfer Of Blast-Effects Mitigation Technologies From Military To Civilian Applications, National Academy Press, National Research Council et. al. 1995.

http://books.nap.edu/books/0309053757/html/R1.html

Protection Of Federal Office Buildings Against Terrorism, National Academy Press, Committee on the Protection of *Federal* Facilities Against Terrorism et. al., 1998.

http://books.nap.edu/books/NI000265/html/R1.html.

Bombs, Protecting People And Property, United Kingdom's Home Office, 1994.

http://www.mipt.org/pdf/bombs_protectpeopleproperty.pdf

Business As Usual, Maximizing Business Resilience To Terrorist Bombings, United Kingdom's Home Office, 1999.

http://www.mipt.org/pdf/ukhomeoffice_businessasusual.pdf

6.3 Biological and Chemical Threats

Building owners and management should stress to occupants that removal, analysis and decontamination are the responsibilities of hazardous materials emergency response professionals who are trained and equipped to handle these types of situations. Some fire departments may be able to assist with the initial containment and decontamination of an emergency scene. However, it is the responsibility of building owners or managers to arrange with private companies which specialize in hazardous material handling for the complete clean-up and decontamination of the site.

This section sets out some basic information that may be shared with occupants. Occupants should be warned not take any actions beyond the basic steps needed to immediately limit the spread of these agents.

What are the characteristics of a chemical agent?

- Generally in liquid form and often aerosolized (fine mist).
- Has a unique odour and colour. Common odours for chemical agents include bitter almonds, peach kernels, fresh mown hay, mustard, onion, garlic, geraniums or green grass.
- Most result in immediate symptoms or are delayed for a few hours at most.
- Inhalation is the most likely route of attacking your body.
- Attack routes may also be through food/water contamination or skin absorption.
- Many likely agents are heavier than air and tend to stay close to ground.
- Some will break down fairly rapidly when exposed to sun, diluted with water, or dissipated in high winds.

What are the characteristics of a biological agent?

- Generally in liquid or powder form.
- No odour or colour.
- Symptoms may be delayed for days.
- Inhalation most likely and effective attack route.
- Attack routes may also be through food/water contamination or skin absorption.

- Many likely agents are heavier than air and tend to stay close to ground.
- Most will break down fairly rapidly when exposed to sun, diluted with water, or dissipated in high winds.

What are the warning signs of a biological/chemical attack?

- Droplets of oily film on surfaces.
- Unusual dead or dying animals in the area.
- Unusual liquid sprays or vapours.
- Unexplained odours.
- Unusual or unauthorized spraying in the area.
- Multiple victims displaying symptoms of nausea, difficulty breathing, convulsions, disorientation, or patterns of illness inconsistent with natural disease.
- Low-lying clouds or fog unrelated to weather, clouds of dust, suspended or coloured particles.
- People dressed unusually (long-sleeved shirts or overcoats in the summertime) or wearing breathing protection particularly where large numbers of people tend to congregate, such as subways or stadiums).

What measures should be taken where the release has occurred within a building?

- Immediately protect breathing airways (distance yourself from contamination source, cover mouth and nose with handkerchief, clothing, etc.).
- Leave the area of attack immediately and move outside and upwind from the source of attack.
- If evacuation to the outside is not possible, move occupants upwards to an interior room on a higher floor since many agents are heavier than air. Measures for "shelter in place" should be taken (see below).
- Cover bare arms and legs and make sure any cuts or abrasions are covered or bandaged.
- If splashed with an agent, immediately wash it off using warm soapy water.

- Shower with soap and water as soon as possible.
- If water is not available, talcum powder or flour may be used to decontaminate liquid agents. Sprinkle liberally over affected skin area, wait 30 seconds and brush off with a rag. (Note: The powder absorbs the agent, so it must be brushed off thoroughly. Treat this powder as contaminated. If available, rubber gloves should be used when carrying out this procedure)
- Report the incident to the police (dial 911) and supervisory staff.
- Notify building security.
- Seek medical assistance as soon as possible.

What measures should be taken to "shelter in place" where outdoor airborne contaminants may be impacting a building?

Building management should establish procedures and provide training to have management and maintenance staff quickly:

- Notify occupants of the hazard and reasons to "shelter in place".
- Seal building so contaminants cannot enter.
    - Close windows and doors (an inventory of openings should be available and staff designated to close or seal specific openings).
    - Seal gaps under doorways, windows, and other building openings (sufficient sealing materials should be kept on hand to perform this task)
    - Turn off heating, air conditioning and ventilation systems.
- Monitor radio or television stations for further updates and remain in shelter until authorities indicate it is safe to come out.
- Move occupants upwards to an interior room on a higher floor since many agents are heavier than air.

For additional information see:

Health Canada – Infectious Substances:

http://www.hc-sc.gc.ca/pphb-dgspsp/msds-ftss/index.html

Health Canada – *Anthrax*

http://www.hc-sc.gc.ca/english/media/releases/2001/anthrax_info.htm

U.S. Department of Health and Human Services , Agency for Toxic Substances and Disease Registry (ATSDR),

http://www.atsdr.cdc.gov/atsdrhome.html

Oxford University: The Physical and Theoretical Chemistry Laboratory - Chemical and Other Safety Information:

http://physchem.ox.ac.uk/MSDS/

MSDS Resource Library

http://www.reade.com/MSDS_Links.html

Hazardous Materials Management - General information on hazardous materials

http://www.hazmatmag.com/

6.4 Suspicious Package/Device

Building owners should review mail-handling procedures. Where the risk of receiving contaminated mail is high, they may wish to consider opening mail off site or in locations that may be more easily decontaminated. Use of gloves and respirators or a glove-box will also protect persons opening mail.

Personnel that work in a Mail Room and others who accept and handle deliveries made by courier and others should receive training on how to identify and handle suspicious packages. The extent of this training would correspond to the degree of risk related to the occupancy of the building. (e.g. a commercial building containing foreign consulates would be at higher risk than a residential building.)

The following information should be shared with occupants to assist them in identifying and responding to suspicious envelopes and packages.

What are the characteristics of a suspicious package?

Some characteristics of suspicious packages/letters include the following:

- Excessive, inadequate or missing postage
- Handwritten or poorly typed addresses
- Incorrect titles or no name
- Misspelling of common words
- Oily stains, discolouration or odour
- No return address
- Excessive weight
- Lopsided or uneven envelope
- Protruding wires or aluminum foil
- Excessive security material such as masking tape, string, etc.
- Visual distractions
- Ticking sound
- Restrictive markings such as "Personal", "Confidential", or "To Be Opened By"
- Postmark city/province/state does not match the return address
- Foreign mail from politically unstable or hostile countries
- Unprofessional wrapping
- Threatening markings on exterior of package
- Inappropriate air mail or special delivery stickers

What should occupants do if they find a suspicious package/device?

- Do not shake or bump it.
- Do not open, smell, examine, touch or taste.
- Treat it as suspect.
- If you suspect that the package/device is a bomb:
    - Do not cover it.
    - Open doors and windows to minimize blast effects.
- If you suspect that the package/device is contaminated with a chemical or biological agent:

- Gently place in clear plastic bag, if available or cover with other materials.
- Close door.
- Minimize physical contact with other people.
- Wash your hands with soap and water.
- Remove contaminated clothing and place in a sealed container (e.g., plastic bag) to be forwarded to emergency responders. Shower (with soap and warm water) as soon as possible.
- List all people who may have been in contact or close proximity to the suspicious package/device and provide this list to appropriate authorities.
- If necessary, seek medical assistance as soon as possible.

- Clear the immediate area where the package was discovered.
- Notify supervisory staff and provide the following information:
  - Object location
  - Object description
  - Any other useful information
- Report incident to the police (dial 911).
- Notify your emergency response team (floor wardens, etc.), building management, and other building occupants of the potential emergency.
- Attempt to establish ownership of the object.
- If necessary, initiate evacuation procedures.

For additional information see:

U.S. Department of the Treasury - Bureau of Alcohol, Tobacco and Fire Arms – *Detect Suspicious Packages*

http://www.atf.treas.gov/explarson/information/detectsusp.htm

U.S. Department of the Treasury - Bureau of Alcohol, Tobacco and Fire Arms – Suspect *Letter and Package Indicators*

http://www.atf.treas.gov/explarson/information/indic.htm

Emergency Measures Ontario

http://www.solicitorgeneral.msg.gov.on.ca/english/public/emo.html

Canada Post – *Suspicious Mail Alert*

http://www.canadapost.ca/business/corporate/about/announcements/hazard-e.asp

United States Postal Service - *What constitutes a suspicious letter or parcel? What Should I do if I Receive an Anthrax Threat by Mail?*

http://www.usps.com/news/2001/press/pr01_1010tips.htm

6.5 Physical Threats

Criminals or terrorists may use firearms, knives, arson, vehicles and other "low tech" devices to introduce physical threats. Security measures and physical barriers should be considered as means of preventing or minimizing the impact of these threats and occurrences.

There have been numerous examples of serious physical threats to injure that resulted in actual physical injury or death, including the massacre at the École Polytechnique in Montreal in 1989 and the Columbine School occurrence in 1999.

Well-planned and prearranged lockdown procedures may be appropriate for application in occupancies such as schools to protect students and staff. The lockdown practices and procedures should never interfere with the occupants' abilities to evacuate promptly should the circumstances warrant it.

Security personnel, receptionists, complaints department personnel or other employees who are in a position where they may have to deal with violent or potentially violent people should be given training on conflict resolution and workplace violence. Several community colleges offer this type of training.

Arson involves the criminal use of fire to cause damage to property. Arsonists may use various types of accelerants to increase fire growth and fire spread. To minimize risk of capture, arsonists prefer to use readily available accelerants, such as gasoline, that they find near their target. Wastepaper, cardboard, etc. is also a favourite accelerant for arsonists. Therefore, good housekeeping and security are effective at reducing these fire risks.

For additional information see:

Workers Health and Safety Centre, Ontario, Training on workplace violence

http://www.whsc.on.ca/home.html

U.S. Department of Labor, Occupational Safety and Health Administration, general information on workplace violence.

http://www.osha-slc.gov/SLTC/workplaceviolence/

Training Materials for Workplace Violence, U.S. Department of Labor, Occupational Safety and Health Administration, Training guidelines in PowerPoint and Adobe Acrobat.

http://www.osha-slc.gov/SLTC/workplaceviolence/wpvmemo.html

6.6 Hazardous Materials Accidents

A hazardous materials accident can occur anywhere. Buildings located near chemical manufacturing plants are particularly at risk. However, hazardous materials are transported on our roadways, railways and waterways daily, so any area is considered vulnerable to an accident.

Building management should maintain a current inventory of hazardous materials used on-site including current Material Safety Data Sheets (MSDS) as required by the Workplace Hazardous Material Information System (WHMIS). Appropriate spill control and clean-up materials and equipment should be readily available. Staff should be trained in spill clean-up procedures. Emergency phone numbers for hazardous materials disposal companies should also be available.

If possible, managers should determine what hazardous materials might be present on neighbouring properties. A risk assessment of this exposure should also be carried out.

What should building management do if a hazardous materials accident occurs near a building?

- Call 911 or the local fire department to report the nature and location of the accident as soon as possible.
- Keep building occupants away from the accident scene.
- Do not walk into, touch, smell or taste any of the spilled substance. Try not to inhale gases, fumes and smoke. If possible, cover mouth with a cloth while leaving the area.
- Try to stay away from accident victims until the hazardous material has been identified.
- Try to stay upstream, uphill and upwind of the accident with clear access to an evacuation route.

What measures should be taken to "shelter in place"?

- See Subsection 6.3 above.

Assisting accident victims.

- Do not try to care for victims until the substance has been identified and authorities indicate it is safe to treat victims.

For additional information see:

Oxford University: The Physical and Theoretical Chemistry Laboratory - Chemical and Other Safety Information:

http://physchem.ox.ac.uk/MSDS/

MSDS Resource Library

http://www.reade.com/MSDS_Links.html

Hazardous Materials Management - General information on hazardous materials

http://www.hazmatmag.com/

6.7 Radiological Accidents

A radiological accident is an event that involves the release of potentially dangerous radioactive materials into the environment. This release will usually be in the form of a particulate cloud or vapour plume and could affect the health and safety of anyone in its path. In Ontario, Emergency Measures Ontario is the provincial authority to direct a response during a nuclear emergenc y.

Where can radiological accidents occur?

Radiological accidents can occur anywhere that radioactive materials are used, manufactured, stored or transported. Nuclear power generating stations, hospitals, universities, research laboratories, industries, major highways, railroads and shipping yards could be the site of a radiological accident.

How can building management minimize radiation exposure to occupants in the event of an accident?

Distance

The more distance between occupants and the source of the radiation, the less radiation will be absorbed. In a radiological accident, officials may evacuate, thereby increasing the distance between occupants and the radiation.

Shielding

Like distance, the more heavy, dense materials between occupants and the source of the radiation, the better. This is why officials could advise building management to "shelter in place" if a radiological accident occurs. In some cases, building walls may provide sufficient shielding to protect occupants.

Time

Limiting the time spent near the source of radiation reduces the amount of radiation you will receive. Some sources of radioactivity may be dispersed by the wind or lose its strength by rapid decay.

Following a radiological accident, authorities will monitor any release of radiation and determine when the threat has passed.

What should building management do if alerted to a radiological emergency?

Tune to your local radio or television station for information and direction from Provincial or community authorities. Information may also be communicated by other electronic means (e.g. Internet)

If advised to evacuate the building, management should:

- Organize a calm evacuation.
- Close and lock windows and doors.
- Turn off air conditioning, vents, fans, and heating equipment.
- Arrange public transportation for those who have not made arrangements.

If occupants are to remain in the building management should advise them to:

- Follow the "shelter in place" procedures set out in Subsection 6.3.

For additional information see:

Provincial Nuclear Emergency Plan

http://www.sgcs.gov.on.ca/english/public/pnep2.html

Health Canada – *The Federal Nuclear Emergency Plan*

http://www.hc-sc.gc.ca/ehp/ehd/rpb/environ/fnep/

6.8 Carbon Monoxide

Carbon monoxide (CO) is a by-product of the incomplete burning of fuels, including wood, heating oil, propane, kerosene, gasoline, diesel fuel and natural gas. All fuel-burning equipment and appliances are potential sources for carbon monoxide. Therefore, the key to preventing exposure to this odourless, colourless, tasteless and very toxic gas is adequate maintenance of these appliances. Additional protection will be afforded by locating CO detectors near these appliances. Some municipalities have bylaws that require these detectors to be installed in buildings.

Building owners/managers should be aware that carbon monoxide hazards could result from:

- Deteriorating equipment: fuel fired heating systems and appliances that are not properly maintained.
- Confining or enclosing fuel-fired equipment: An inadequate fresh air supply for the safe burning and venting of exhausts.

- Dirt and blockage (i.e. blocked chimney flue).
- Careless use of equipment (i.e. running a vehicle engine in an attached garage).
- Using equipment that consumes or exhausts air.

Management should be aware of the following danger signs of CO:

- Stale, stuffy air in your building.
- Occupants have symptoms of CO exposure (see below).
- The pilot light on gas-fired equipment keeps going out.
- A sharp odour or the smell of natural gas occurs when equipment turns on.
- The burner flames and pilot light of a natural gas furnace or other equipment are mostly yellow, rather than a clear blue. (Note that some natural gas fireplaces are designed to have yellow flames).
- Chalky, white powder forms on a chimney or exhaust vent pipe or soot builds up around the exhaust vent.
- Excessive moisture on walls or windows in areas where natural gas equipment is on.
- CO detectors alarm.

What are the symptoms of CO exposure?

Exposure to CO can cause flu-like symptoms without a fever, including:

- Headaches
- Nausea
- Dizziness
- Drowsiness or fatigue
- Burning eyes
- Confusion
- Loss of coordination

Where occupants experience these symptoms inside a building, but feel better when they go outdoors or away from the building, CO or other pollutants may be the cause.

What procedures should be followed if CO exposure is suspected?

- Evacuate the building immediately and call 911 or your local fire department.
- Seek medical attention for those that need help

For additional information see:

Technical Standards and Safety Authority, Carbon Monoxide Exposure:
http://www.tssa.org/about_tssa/carbon_monoxide.asp

6.9 Natural Gas Leaks

Natural gas is colourless, odourless, non-toxic and highly flammable gas. For safety, a smell much like rotten eggs is added to the gas to aid detection. Because it is lighter than air it may quickly spread throughout a building.

In the event of a natural gas leak, building management should:

- Immediately shut off the gas at the main valve and any secondary valves if necessary.
- Evacuate the building.
- Instruct occupants to not smoke or use any electrical devices, including cell phones.
- Call 911 from a phone located well away from the source of the leak.
- Call your gas company from a phone located well away from the source of the leak.

Building management should retain a list or drawings that identify the locations of all gas shut-off valves, not just the main shut-off valve locations.

6.10 Elevator Malfunctions

Building management should ensure that elevators are properly maintained. Elevator cars should be readily identifiable with car/shaft number on the inside of the car. A means of communicating (i.e., telephone) should be provided in each elevator.

In the event of occupants trapped in an elevator, building management should:

- Never attempt to evacuate occupants stranded in the elevator.
- Contact the elevator service company. Only qualified personnel should be permitted to correct elevator malfunctions, or remove stranded occupants, as this is highly specialized work.
- Maintain communications with trapped occupants until they are safely evacuated to:
    - assure them that they are safe and that help is on the way.
    - caution them not to panic.
    - remind them not to try and force the elevator doors open.
- Conduct a thorough investigation of the cause immediately after the incident.

For additional information see:

Technical Standards and Safety Authority, Elevating Devices Branch

http://www.tssa.org/elevators/default.asp

6.11 Medical Emergencies

Every building runs a risk of facing a medical emergency. However, there are certain types of properties where medical emergencies may be more common. Examples include properties that house senior citizens, the disabled, large public gatherings, and industrial activity. Your Emergency Plan should incorporate medical and first aid procedures that include:

- Emergency contact phone numbers.
- Names and phone numbers of occupants with accredited training in lifesaving techniques.

In Ontario, the Workers Safety and Insurance Board (WSIB) requires first aid stations in workplaces. Specific requirements can be found in RRO 1990, Regulation 1101. This regulation also requires first aid training for workplaces.

Managers of buildings with large occupant loads may wish to consider providing CPR training, automatic external defibrillators and medical oxygen in addition to the basic first aid requirements.

For additional information see:

Workplace Safety and Insurance Board (Ontario) –*First Aid Requirements* (Regulation 1101)

http://www.wsib.on.ca/wsib/wsibauthoring.nsf/LookupFiles/

DownloadableFileFirstAid/$File/FirstAidEng.pdf

7. Emergencies Due to Natural Disasters

Emergencies due to sudden and powerful natural events are capable of inflicting considerable damage to property and placing many lives at risk. These types of emergencies generally result from severe weather conditions or earthquakes. Subsequent flash floods that may follow can result in further property damage and risk to lives.

This section covers the procedures that should be taken in the event of a major emergency due to natural disasters. It provides the necessary steps that need to be taken by those who are directly responsible for building emergency preparedness as well as by the building occupants. The building occupants' roles and responsibilities should always be included in the Emergency Plan and be available to them as a reference. Regardless of whether or not they have been delegated any formal responsibilities, occupants play an integral part in effectively executing the Emergency Plan and ensuring their own personal safety. Their role is particularly important in buildings where delegated emergency personnel are not available 24 hours a day, 7 days a week.

Many types of circumstances besides fire may require a building or portions of a building to be evacuated. Some of these circumstances are discussed in the following subsections of the guideline.

Other types of circumstances warranting evacuation and not discussed in detail could include: serious fires in a neighbouring building, a serious hazardous chernical spill involving the transportation of a dangerous product(s), forest fires, a large natural gas leak originating outside of the building, etc.

Usually in these types of situations, local authorities will likely be involved in responding to, and/or monitoring the emergency situation. Where applicable, building management should consult with authorities to determine an appropriate course of action. However, in some situations, a decision to evacuate may have to be made by building management on their own without the opportunity for consultation.

When circumstances warrant an evacuation, the building occupants must be notified in an appropriate manner, taking into consideration the serious nature and urgency of the situation.

For additional information see:

Emergency Measures Ontario

http://www.solicitorgeneral.msg.gov.on.ca/english/public/emo.html

7.1 Earthquakes

The seismic activity level in Ontario is generally well below what is experienced along Canada's west and east coast. Historically, areas along the Ottawa River and the St. Lawrence River have been the most active within the Province. Over the past 30 years, this area has averaged 15 earthquakes per year with a magnitude of 2.5 or higher. By comparison, an annual average of only 2 or 3 earthquakes of this size occur in Southern Ontario. Northern Ontario has even lower seismic activity, averaging 1 or 2 earthquakes over this period.

Nevertheless, going further back in history, earthquakes with a magnitude in excess of 5 have been experienced in Ontario. As well, Ontario has felt the effects of earthquakes originating from nearby Provinces and States. Therefore, some consideration should be given to preparing for such an event.

Building management should:

- Warn occupants to expect that the fire alarms and sprinklers will go off during an earthquake.
- Instruct occupants that it is very dangerous to try to leave a building during an earthquake because objects can fall on occupants. Many fatalities occur when people run outside of buildings, only to be killed by falling debris from collapsing walls and broken glass. Occupants are generally safer to stay where they are until the earthquake is over.
- Evacuate occupants once the shaking has stopped. Occupants should be evacuated using the stairs and moved quickly away from the building to prevent injury from falling debris.
- Call emergency services, as appropriate, and then give first aid as necessary. Do not try to move seriously injured people unless they are in immediate danger of further injury.
- Put out small fires quickly if this can be done without endangering personnel. This will prevent fires from spreading until firefighting resources become available. Fire is the most common hazard following earthquakes.
- Clean up flammable liquid spills immediately.
- Expect aftershocks.
- Warn occupants of fallen power lines and other hazards.
- Arrange for qualified people to inspect the building for damage that may have occurred.

For additional information see:

Natural Resources Canada, National Earthquakes Hazard Program:
http://www.seismo.nrcan.gc.ca/historic_eq/eastcan_e.html

7.2 Severe Storms

Thunderstorms, tornadoes, hail, blizzards, ice storms, high winds and heavy rain can develop quickly and hit hard, posing a threat to life and property. Some problems cannot be prevented. High winds will topple trees and heavy rains will cause rivers to flood. But some damage can be avoided or at least reduced, if precautionary measures are taken, such as knowing the type of storms common to your area and what time of year they are likely to strike.

How will building management know if a severe storm is approaching?

Environment Canada monitors the weather 24-hours a day, seven days a week. If a severe storm is on the horizon, the weather service issues watches, advisories and warnings through national, regional and local radio and television stations, and Environment Canada's Weatheradio.

If a weather warning is issued for a tornado, it means that one or more tornadoes have been observed or are forecast for the specified area. Other warnings include those for a severe thunderstorm, blizzard, ice storm, high winds, heavy snow, snow squall, heavy rain and heavy freezing rain.

How can building management prepare for a severe storm?

Storms such as tornadoes often strike too quickly to allow management to provide instructions to occupants at the time they occur. Occupants must be instructed as to correct procedures in advance. For example, storms that are accompanied by high winds would require occupants to retreat to interior spaces away from windows.

Management should be aware that electrical power might be unavailable for an extended period of time. Therefore, backup generators and adequate fuel supplies may be very helpful in maintaining essential building services (e.g., heating). After a severe storm, it may be necessary to obtain the services of qualified personnel to inspect the building for damage that may not be readily identified.

For additional information on maintaining business continuity, see Appendix B.

7.3 Floods

Building management should assess the threat of flooding to their building. Usually this is easily accomplished due to a history of similar earlier events. Alternatively, they can contact the local municipal planning office for flood information. Many insurance companies also have information on the potential for flooding in specified areas.

Where flooding is a potential risk, building management may wish to consider the following:

- Providing pumps, generators, sandbags, etc., for temporary flood relief.
- Providing permanent breakwaters and dikes where the flood potential is high.
- Evaluate the potential impact on ground level and underground tanks.
- Hazardous materials stored at or below grade moved to a safe location.
- Protection of drinking water sources.
- Impact of floodwater on high value and process equipment.
- Electrical hazards that may be created due to the presence of water (to both permanent and temporary wiring).
- Affect of flooding on the structural integrity of the building.
- Retain a list of qualified personnel and contractors who can be contacted to assess and repair flood damage.
- Arrange to have drinking water tested after a flood. This is particularly important in areas where drinking water is obtained from wells.

For additional information see:

Canadian Mortgage and Housing – *Flood, What to do before and after*

http://www.cmhc-schl.gc.ca/en/burema/coem/flood/flwhbeaf/flwbeaf_001.cfm

Federal Emergency Management Agency, National Flood Insurance Program

http://www.fema.gov/nfip/floodsaf.htm

7.4 Major Electrical Power Failures

Any one of the occurrences described previously can cause or contribute to a major electrical power failure.

Backup generators and adequate fuel supplies may be very helpful in maintaining essential building services (e.g., lighting, heating). In buildings equipped with an emergency power generator, the equipment is required to be tested and maintained in accordance with the Ontario Fire Code. Pre-arrangements should be made to ensure additional fuel supplies could be made available upon demand, in situations where the power failure is for an extended period of time.

In buildings that are not equipped with an emergency power supply, building management and occupants need to be prepared in advance to cope with such a situation by having flashlights and a fresh supply of batteries.

When there is a potential for a power failure occurring simultaneously with the building evacuation, building occupants should avoid using the elevators as a means to leave the building. To be on the safe side, people should be instructed to proceed to evacuate the building promptly using the primary and secondary exits that would normally be used to evacuate the building during a fire. In large buildings, it may be necessary to stage the evacuation in order to ensure that it is conducted in an orderly manner.

For additional information see:

Office of the Fire Marshal – *Essential Fire Safety Information for Emergency Shelters*

http://www.gov.on.ca/ofm/pubsafet/shelters.htm

Office of the Fire Marshal – *Safety Tips for Emergency Lighting and Heating During Power Failure*

http://www.gov.on.ca/ofm/pubsafet/emerglight.htm

Office of the Fire Marshal – *Safety Tips for Standby Generators*

http://www.gov.on.ca/ofm/pubsafet/generators.htm

Electrical Safety Authority – *Standby Generators*

http://www.esainspection.net/

7.5 Roof Collapse

Buildings may experience roof collapse resulting from environmental occurrences such as high winds, tornados, snow, water and ice loading, to list a few.

Building owners and property managers should be aware of the potential for roof failure resulting from these effects. Where wind and snow-loading information is not available for the existing structure, property management should consult with a professional engineer and /or architect to assist in analyzing the integrity of the existing structure.

Based upon information of this nature, tolerable and un-tolerable wind and snow loading conditions can be identified. Procedures can be adopted that would identify conditions when unsafe loads may be experienced and incorporate safe practices for reducing excessive snow and ice loads.

When intolerable conditions are expected or imminent, evacuation may be appropriate.

For additional information see:

Ministry of Labour – Hazard Alert – *Snow Loading and Roof Failures*

http://www.gov.on.ca/lab/ohs/a17e.htm

Appendix A:

Threatening Call Telephone Procedures

- Be calm and courteous.
- Do not interrupt the caller.
- Keep caller on line as long as possible.
- Obtain as much information as you can by completing the Threatening Call Information Report (see following page). A copy of this report should be kept at the switchboard, reception areas and all workstations.
- After the caller hangs up, initiate call trace action, if available. Note that some areas have a *57 or *69 or call display features on their telephone.
- Notify the appropriate supervisory staff member and provide him/her with the completed Threatening Call Information Report.
- Report incident to the police (dial 911).
- Notify your emergency response team (e.g., senior management, floor wardens), building management, and other building occupants of the potential emergency.
- If necessary, initiate evacuation procedures.

Threatening Call Information Report

Name of Employee		Section	
Telephone line call received on	Extension	Time call received	Time call ended

Exact words of caller (continue on back of form)

Background noise of Call

☐ aircraft ☐ bar sounds ☐ children crying ☐ machinery ☐ music

☐ traffic ☐ trains ☐ voices ☐ other (indicate)

Questions to ask

Type of threat (What is it?)	What time will it go off?

Description of threat (What does it look like? Where is it?)

Reason for phoning you (Why did you call me?)

Reason for planting item (Why did you plant the bomb?)

Name of Caller (Who are you?)	Gender of Caller ☐ Male ☐ Female
Approximate Age of Caller	Accent of Caller

State of Caller

☐ Calm ☐ Cool ☐ Crying ☐ Drugged

☐ Emotional ☐ Excited ☐ Immature ☐ Intoxicated ☐ Irrational

Manner of Speech of Caller

☐ Defective ☐ Fast ☐ Frightened ☐ Lisping

☐ Obscene ☐ Polite ☐ Slow ☐ Stuttering ☐ Vulgar

Was the caller's voice familiar?

☐ No ☐ Yes ▼ | Name/Identity of caller

Appendix B:

Business Continuity Planning

Why should a business have a plan for emergencies?

Part of the emergency planning for any organization should include ensuring the ability of the organization to continue to function with the minimum of disruption after a disaster. In the context of business continuity planning, a disaster is any event that could cause a period of total or partial interruption to normal business operations. This could be a fire or explosion or could be a much less dramatic event such as loss of power or telephone service. With the increasing emphasis in industry on maintaining low inventories and "just in time" delivery schedules, even short interruptions can have a significant effect on business.

In addition to the direct costs resulting from an incident, such as damage to the building or equipment, there are also many indirect costs. These could include loss of important data or business records, negative media coverage, loss of market share, dissatisfied customers or clients or legal action by regulatory agencies. Insurance may partially compensate for some of the direct costs, but it will never cover all of the costs to an organization. It may also take many months or even years before the insurance claim is settled.

Although developing a business continuity plan does require some expenditure of time and financial resources, this expenditure should be looked at as an investment rather than as an expense. In the long term, an effective continuity plan can save an organization a great deal of money and emotional stress.

How should a business continuity plan be developed?

It is essential that senior management support the development of the continuity plan. Although outside consultants can assist in the preparation of a plan, managers from all departments in the organization must also be involved. They are intimately familiar with the operations and functions of the organization and are most likely to be aware of any weaknesses or vulnerable areas.

The first step in developing a continuity plan is to assess the various risks to which the organization might be exposed. These could include, but are not limited to, any of the following:

- fire (both internal and external), explosion,
- flooding (both internal and external),
- earthquakes, tornadoes, hurricanes, snow or ice storms, high winds,

- interruption or failure of electrical power, natural gas, water supply, telephone service, heating or ventilation,
- gas leaks, chemical spills (both on and off-site),
- computer failure,
- criminal acts such as bomb threats, biological or chemical contamination, robbery, vandalism, civil unrest, and
- death, injury or serious illness of key management or technical personnel.

After determining what risks need to be considered, each risk must be evaluated to determine the probability that it will occur and what impact it would have on the organization. The probability of occurrence and the impact can be assigned point values or just a more general rating of high, medium and low. This will allow management to determine how much resources should be expended in guarding against the various risks.

Management then needs to develop strategies for addressing each of the risks. The first goal is to prevent the risk from occurring. Since not all risks can be prevented with 100% certainty, the second goal is to minimize the impact on the organization if the event does occur. At all times the safety and protection of employees must be the primary consideration.

How should the plan be communicated?

The plan must be in writing and every person who could be expected to exercise any part of the plan must have a copy. New employees must be made aware of their role in exercising the plan. Careful consideration should be given to the release of confidential and sensitive information in the plan.

The president, plant manager, etc. may not be available at the time an incident occurs and someone else may have to start exercising the plan. At least one copy should be kept off-site and well as a back-up copy of any data or information which is critical to the operation of the organization. Prior arrangements should be made with outside agencies or companies such as the Public Utilities Commission, private contractors, structural engineers, plumbers, electricians, fire restoration companies, etc. whose assistance may be required to normal operations. The plan should include phone numbers where critical people can be reached 24 hrs/day.

What equipment and supplies are needed to support the plan?

The plan should include provision for maintaining an adequate supply of emergency supplies, such as chemical spill kits, and that all emergency equipment, such as generators or fire pumps, is maintained and tested as required. Some events may need to be simulated to ensure that all equipment

and procedures work as intended. This is particularly important where there are sophisticated automated systems such as smoke control systems or systems for shutting down industrial processes. When conducting simulations, care must be taken to ensure that a simulated disaster does not become a real disaster.

Does the plan need to be changed from time-to-time?

The creation of a business continuity plan is not a one-time event. It must be regularly reviewed and up-dated to ensure that it reflects any changes to the facility or operations.

For additional information see:

Emergency Management Guide for Business and Industry, A Step-By-Step Approach To Emergency Planning, Response And Recovery For Companies Of All Sizes by the Federal Emergency Management Agency

http://www.fema.gov/library/bizindex.htm

Disaster Recovery Journal
http://www.drj.com/new2dr/newbies.htm

Appendix C:

Committee to Develop Emergency Guide

FIRE and EMERGENCY SERVICES

- Ontario Municipal Fire Prevention Officers Association
- Fire Fighters Association of Ontario
- Toronto Fire Services
- Ontario Association of Fire Chiefs
- Durham EMS & Ontario EMS Director & Managers
- Municipal Fire Service Instructors Association
- Ontario Municipal Fire Prevention Officers Association

POLICE SERVICE

- Ontario Provincial Police
- Toronto Police Service

GOVERNMENT

- Ministry of the Solicitor General: Office of the Fire Marshal, Emergency Measures Ontario, Policing Services, Communications Branch
- Ministry of Health
- Ministry of Labour
- Management Board Secretariat
- National Research Council of Canada - Fire Risk Management Program

BUILDING OWNERS AND MANAGERS

- Building Owners and Managers Association (BOMA)
- Greater Toronto Apartment Association
- Canadian Institute of Public and Private Real Estate Companies (CIPPREC)
- Ontario Association of Architects

INSURERS

- Insurance Bureau of Canada

Appendix D: Abbreviations

ATF	Bureau of Alcohol, Tobacco and Fire Arms - U.S. Department of the Treasury
ATSDR	Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services
CANASA	Canadian Alarm and Security Association
CMHC	Canadian Mortgage and Housing
EMO	Emergency Measures Ontario
ESA	Electrical Safety Authority
FEMA	Federal Emergency Management Agency
HAZMAT	Hazardous Materials
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
NRC	National Research Council
OFM	Office of the Fire Marshal
OSHA	Occupational Safety and Health Administration , U.S. Department of Labor
TSSA	Technical Standards and Safety Authority